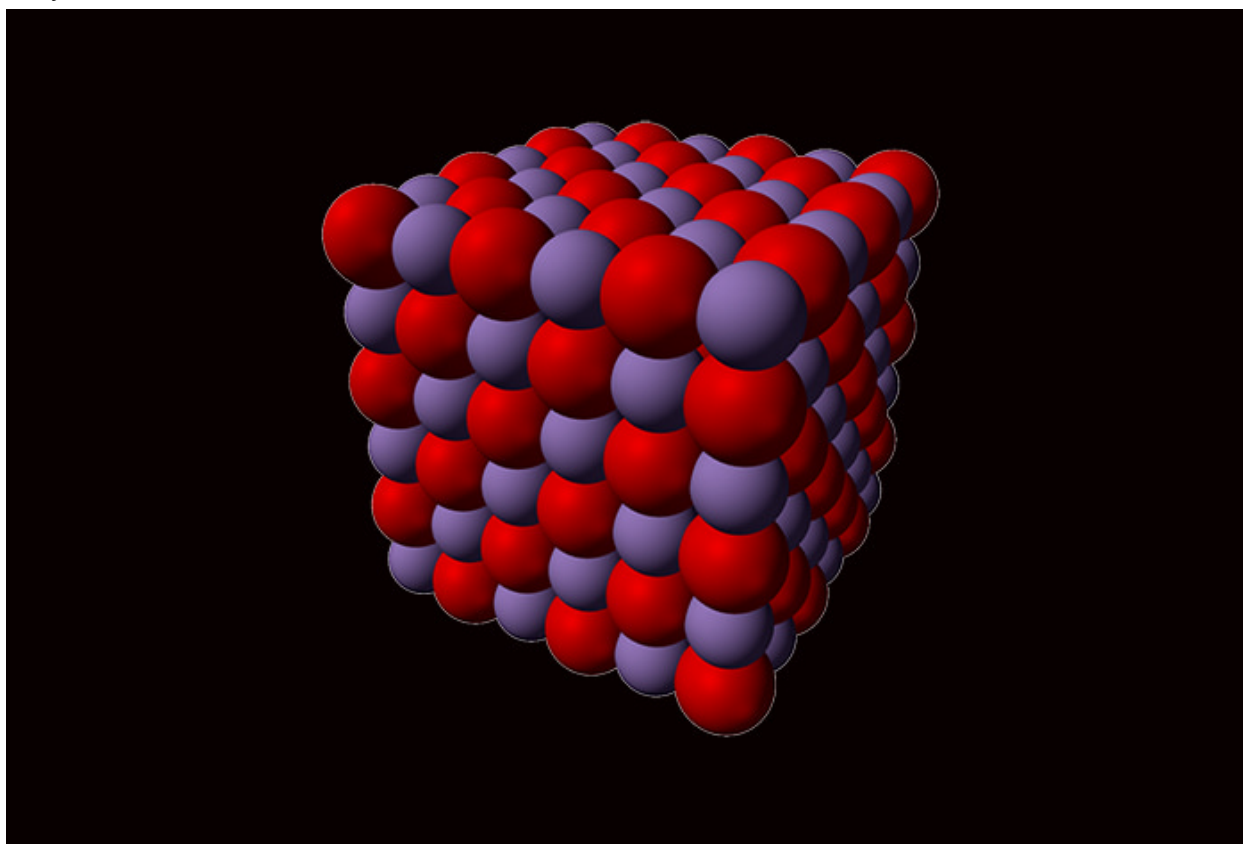


Magnetic interactions in manganese oxide

May 24, 2016



Revealing the Nature of Magnetic Interactions in Manganese Oxide

For nearly 60 years, scientists have been trying to determine how manganese oxide (MnO) achieves its long-range magnetic order of alternating up and down electron spins. Now, a team of scientists has used their recently developed mathematical approach to study the short-range magnetic interactions that they believe drive this long-range order. By comparing measurements of the local magnetic interactions in MnO with those predicted by competing theoretical models, they determined that the antiparallel electron spin alignment is due to neighboring Mn ions interacting magnetically through an intermediary nonmagnetic oxygen ion--a mechanism called superexchange.

The research was described in a paper published on May 11 in *Physical Review Letters* by a collaboration of scientists from the U.S. Department of Energy's (DOE) Brookhaven National Laboratory, Columbia University, DOE's Oak Ridge and Los Alamos National Laboratories.

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